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RESEARCH CONFERENCE ON LEARNING AND THE EDUCATIONAL PROCESS AT STANFORD UNIVERSITY, JUNE 21-JULY 30, 1965.

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A RESEARCH TRAINING CONFERENCE ON LEARNING WAS HELD FOR 37 PSYCHOLOGISTS AND EDUCATIONAL RESEARCHERS. THE 6-WEEK CONFERENCE CENTERED ITS ACTIVITIES ON SUCH TOPICS AS LANGUAGE LEARNING, COMPUTER SIMULATION, INSTRUCTIONAL PROCEDURES DESIGN, ATTITUDE AND PERSONALITY DEVELOPMENT, AND CURRICULUM EVALUATION. LECTURES AND TALKS WERE OFFERED BY INSTRUCTORS AND VISITING CONSULTANTS. TOPICS DISCUSSED INCLUDED (1) LANGUAGE LEARNING, (2) COMPUTER SIMULATION OF INTELLECTUAL PROCESSES, (3) DESIGN OF INSTRUCTIONAL PROCEDURES AND EXPERIMENTATION ON LEARNING, (4) THE NATURE OF APTITUDE, ATTITUDE DEVELOPMENT AND CHANGE, (5) PERSONALITY DEVELOPMENT IN COLLEGE, AND (6) CURRICULUM EVALUATION. ONE OF THE CONCLUSIONS DRAWN WAS THAT A GENERAL ACQUAINTANCE WITH SIGNIFICANT CURRENT WORK WAS ACHIEVED. DEVELOPMENT OF COMPETENCE IN DEPTH, HOWEVER, WAS NOT AS SUCCESSFUL. IDENTIFICATION OF AREAS OF STUDY AND MOTIVATION TO DO RESEARCH WERE INDICATED AS ACCOMPLISHMENTS OF THE CONFERENCE. (RS)

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RESEARCH CONFERENCE ON LEARNING AND THE EDUCATIONAL PROCESS

at Stanford University, June 21-July 30, 1965

Cooperative Research Project No. F-063

Conference directors: Lee J. Cronbach and Richard C. Atkinson, representing the Committee on Learning and the Educational Process of the Social Science Research Council.

Stanford University
Stanford, California

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This report serves several purposes. It is the formal record required under the contract with the U.S. Office of Education, a record for the Social Science Research Council and other cooperating agencies, and a guide to the planning of future conferences having similar purposes.

The idea of summer conferences to stimulate and assist educational researchers, and behavioral scientists whose work is pertinent to education, arose in the SSRC Committee on Learning and the Educational Process. The membership of the Committee at that time included E. J. Gibson, Evan Keislar, and Judson Shaplin, in addition to the conference directors; during 1964-65, Shaplin's term ended, and Lloyd Morrisett and George A. Miller were added. The Committee conducted a conference in 1964 (as Cooperative Research Project F-019) and in the light of that experience planned this second conference for 1965. The Committee will not organize further conferences in this pattern. The pilot work has now been done, and the Committee judges it wise to leave the organization of successor conferences to other agencies. There is a specific provision for the financing of training institutes in the Elementary and Secondary Education Act of 1965. One reason for granting Cooperative Research funds to the Committee was to try out this training device; this report is written in large part for the guidance of those who will plan conferences or institutes under the new Act.

The reader should consider this report alongside the 1964 report for a complete picture. The conference director preparing this report (Cronbach) also served as an instructor, which means that more first-hand experience goes into the report than in 1964. Since many observations are personal, the report is written in the first-person singular. To aid in preparing the report I had the conference schedules and other day-to-day documents, the comments made by instructors during a debriefing conference on the last day, and extensive written statements from nearly all the participants. The information cannot be tabulated objectively. When I speak of a consensus among participants, it should be recognized that not all of them discussed any specific topic, and that on virtually any point one can find some minority sentiment.

Preconference activities. Co-director R. C. Atkinson participated actively in choosing instructors, selecting participants, and laying general plans. He was otherwise engaged during the conference period, and at that time I became sole director, with considerable help from the conference secretary Clara Hahne and the various instructors.

The application for support of the conference was made on April 15, 1964 with the expectation that staff review could lead to a mid-summer authorization at the latest. Final approval from the U.S. Office of Education was not received until November. Late approval is very troublesome. I could not ask for commitments from instructors and could not announce the conference until we had definite assurance of funds. Of the several unfortunate consequences of the delay, the most serious was that the schedule for publishing news notes in The

American Psychologist made it impossible to announce the conference to the membership of the American Psychological Association. I advise the organizer of a future conference to apply for funds about 22 months prior to the conference, so that he can recruit instructors and participants without excessive time pressure. I also urge expeditious review.

Announcements were made through newsletters of the Social Science Research Council, the American Educational Research Association, the Division of Educational Psychology of the American Psychological Association, and the British Psychological Society. The 1964 conference had been announced only in the United States. For the 1965 conference, money for overseas travel was added, and the B.P.S. was asked to announce this. The B.P.S. Bulletin proved to be an excellent medium, bringing applications from far corners of the world. Many excellent applicants were attracted by the instructors' word-of-mouth advertising.
A brochure was supplied to those who wrote for information as a result of the news announcements. Also, the brochure was mailed to all U.S. departments of psychology and educational psychology. This device is necessary but only moderately effective. Such a flyer may get lost in an inch-thick posting of scholarship announcements, or may sit forever in the department chairman's overstuffed in-basket.

There are going to be many more conferences and summer opportunities in the future. Some agency should collate information about the opportunities each year so that conferences can be soundly coordinated and announcements can be concentrated in one listing. How little this is now done is illustrated by the fact that another Stanford professor conducted a 1965 conference under U.S. Office (NDEA) funds to provide research training for college counseling staffs. Some of my participants would likely have been better off in this conference, but they did not learn of it. I myself learned of it only in May -- much too late for any significant coordination of arrangements. At one point in the Spring we were competing for the time of the same consultants without realizing it.

The time schedule for preconference activities was roughly as follows:

May-October, 1964	-- recruitment of instructors
October-December	-- announcement and answering of inquiries
January	-- receipt of applications and circulation for review; meeting to select participants and lay plans
February	-- communication to applicants regarding conference membership
March-May	-- arranging facilities on the Stanford campus, helping participants with summer housing, circulating reading lists and other information, enlising consultants and short-term instructors

The participants are critical of the advance information they received regarding consultants and reading assignments. We did not do a good job of this, and I am not sure the job can be done right. The first problem is that consultants have to be enlisted over a considerable period of time. Since this process went on up to the start of the conference, and even later, it is not feasible to send out the list of consultants early. The readings an instructor would like participants to cover could be sent, but the instructors are busy with their regular jobs and seem unable to free time for detailed planning until late in the year. We got out limited reading lists only in the few weeks just before the conference. If the contract were approved earlier and instructors had more time to work, they might do better. My judgment is that each instructor should send out a brief but meaty list early; this would provide a minimal common ground from which discussion could start. The participants, however, frequently urge that long lists be supplied, four months before the conference. They think they could take time from <u>their</u> Spring jobs to do a lot of reading; I am not so sure. It would be unfortunate to send a long list from which each person would select something different; that would produce no common background, and would indeed increase the differences within the group.

<u>Finances</u>. The administrative budget for the conference provided essentially for half-time for one secretary for 12 months plus four weeks of my time (in addition to the salary payment made to me as instructor). This was too skimpy. Administrative matters occupied uncountable hours of my time during the spring, and during the summer seriously interfered with my work as instructor. As a minimum, a half-time administrative assistant should be added for eight months. Even with this help, the conference director must give a good deal of attention to negotiations and arrangements. The U.S. Office should not use our administrative costs as a standard for future conferences.

Out total cost figured out to about $3000 for each day of the conference. The largest items were instructor salaries and participant expenses. Each instructor was paid for two months at his normal salary rate; this covered six weeks of conference and two weeks of planning and preliminary meetings. During the conference period instructors were carrying a load far in excess of that usual in a University and were unable to carry on any of the research, writing, or consulting that plays a part in the usual academic week. We paid the instructors at a fair but ungenerous rate for the services we requested; out of their enthusiasm they gave twice as much service as we paid for.

The participant received one round-trip tourist jet fare from his home base, plus $16 for maintenance for 42 days. This covers essential costs, but it does not allow for the fact that today's academic man can usually count on 11 months' salary if he stays home. Some of our participants were allowed by their home institutions to continue their salaries for conference attendence; others sacrificed summer earnings. Fortunately, we had a modest grant from the Carnegie Corporation to provide stipends to a few of those with no other summer income. The basic stipend was $600 to postdoctoral and $400 to predoctoral applicants.

We explained to participants that fellowships commonly pay less than a full salary rate since a Fellow has no assigned duties, and that we were operating under a similar philosophy. With this before them, nearly all the American participants characterize the financial arrangements as "adequate", though a few say that they would have been unable to come if their institutions had not allowed them to carry their regular salary. The Carnegie stipends, though well below normal salary levels, eased the situation appreciably; the funds provided by the U.S.O.E. were insufficient. The Conference was attractive enough, in terms of its offerings and its setting, to make some financial loss acceptable. The non-American participants were well satisfied, since at home they would be without summer salary.

Whether participants should receive stipends is arguable; there has been a long tradition of expecting the scholar to reduce his standard of living while improving himself. If the national interest is better served by having the participant attend such a conference than by having him give refresher courses for teachers or stay at work on his own research project -- these being the two common sources of summer income -- there had better be payments to cover his mortgage and provide for his dependents, as well as his direct conference expenses.

More important than the question of whether to pay is the question of uniformity of standards. There was a conference at the University of Wisconsin in 1965, having aims roughly similar to ours. For perhaps no better reason than that the two contracts were negotiated in different months by different U.S. Office representatives, quite different rules were laid down regarding payments to participants. While no exact comparison can be made, it appears that our participant who received U.S.O.E. money only was hundreds of dollars behind a comparable Wisconsin participant. There is no justification for this type of inequity. (See note p. 4a.)

Conference staff. In 1964 we divided the conference into four groups, each with its own team of two instructors. The final evaluation suggested that this division had unfortunate consequences. Participants had an intensive experience with their own group, but they rarely became acquainted with the ideas of the remaining three-fourths of the conference. Those who could have profited from activities of a group to which they were not assigned did not feel free to shift to those other activities. We planned from the start to arrange the 1965 conference so that each participant had access to the full program.

The basic group of instructors, and their broad fields of interest, were as follows: Lee J. Cronbach, Departments of Education and Psychology, Stanford University; general educational psychology, individual differences, measurement and evaluation. Robert Glaser, Departments of Psychology and Education, and Director of Research, Learning Research and Development Center, University of Pittsburgh; subject-matter learning, evaluation, instructional systems. Wallace

While this report was in preparation, Guidelines for the training program (including Institutes) to be supported under the Elementary and Secondary Education Act of 1965 have come to hand. For the most part, these guidelines are consistent with our experience. The financial provisions, however, are even more stringent than those under which we operated in 1965. The limitation of instructors' pay to the weeks the institute is in session is unsound, both because of the overload characteristically involved and the necessity of preconference communications, planning meetings, etc. The analogy to ordinary summer sessions does not hold for institutes such as ours. Our payment for two extra weeks was, as stated above, ungenerous. For participants, it is proposed to pay a stipend of $75 per week, plus $15 per week per dependent. This would figure out at $450 per participant without dependents, compared to the $672 which was our minimum payment for maintenance in 1965. The $450 allowance may be acceptable to those who are able to attend institutes while continuing their basic salary, but it will surely discourage a large number of highly desirable postdoctoral participants from applying.

E. Lambert, Department of Psychology, McGill University; general social and experimental psychology, motives and attitudes, psycholinguistics. Walter R. Reitman, Department of Psychology, University of Michigan; cognition and thought, complex information processing, computer simulation of mental processes. David E. Wiley, School of Education, University of California, Los Angeles (now at University of Chicago); statistics, experimental design, concept identification.

In view of the excellent results these instructors obtained*, there will be no misunderstanding when I refer to the number of refusals we had from prospective instructors, before the team was filled. Here is the most serious problem of the conference organizer. The list of those who declined to serve as instructors (often with convincingly expressed regrets) is a Who's Who of the relevant fields of psychology. We decided early that the instructors should be men with currently active research programs. Many such men expressed interest in the purposes of the conference but had already made commitments for the summer more than a year in advance, or were unwilling to leave their laboratories for the six weeks required. It would not solve the problem to use instructors from the locale of the conference; the conference absorbs all the energy an instructor can give, and he cannot direct graduate students or a research staff in moments stolen from the conference. (My summer 1965 doctoral students can testify to this.) In the end, we assembled a team each of whom has a distinguished record and deep competence in some pertinent area. They are relatively junior members of the profession, however; three of the four held a rank below full professor when selected. Applicants seemed to be satisfied to take on trust the judgment of SSRC and its Committee in choosing less-known instructors. "Big names" are not needed to elicit good applications.

Whereas we had eight instructors for the full term in 1964, we engaged only five in 1965, and one of them was to be a statistical consultant more than a seminar leader. The plan was to extend the range of instructors by inviting several persons for two weeks, each to conduct a specialized seminar. Almost everyone asked to serve in this way declined and the plan had to be radically modified. It appears that a two-week absence from one's home base is almost impossible to arrange; six weeks is easier, and more gratifying when it can be tied to a family vacation. As matters developed, we enlisted two of the participants for instructor roles (without regular compensation!). Joshua Fishman of Yeshiva University worked as coinstructor with Lambert, particularly adding a sociolinguistic note to the discussions of language research. Harry Munsinger of the University of Illinois conducted a seminar dealing with those aspects of motivation that have to do with information gathering (curiosity, interest, etc.). Jan Smedslund of the University of Bergen spent four weeks at the conference as a seminar leader and resource person on child cognitive psychology. Two other consultants,

*I shall not encumber the report by reiterating the obvious disclaimer; such laudatory statements are to be understood as referring to instructors other than myself.

Ernst Rothkopf of the Bell Telephone Laboratories and Leo Postman of the University of California at Berkeley, spent five and three days respectively in a seminar on laboratory studies of learning coordinated by Glaser. A team headed by Duncan Hansen of Stanford University presented six sessions on Stanford research on computer-aided instruction.

About two dozen consultants came to the conference for periods ranging from three days to two hours. The consultant was selected by one of the instructors to cover a theme that deserved the attention of those working in his area. I added a few others to cover off-beat topics. The full list of visitors and topics is included in the schedule (Appendix A).

Mrs. Clara Hahne served as conference secretary, capably making the endless arrangements required to assemble a group from the far corners of the earth and make them comfortable for six weeks, while at the same time serving the corps of instructors. She was assisted by Cynthia Hodge (preconference), Marjorie Nash and Elizabeth Gage. Miriam Betensky was our librarian for the second year. I speak for all participants and instructors in expressing appreciation for the fine help of this staff.

Organization and program

The most important fact about the conference organization was its informality and flexibility. It was stated firmly at the initial session of the conference that each individual was responsible for choosing his own activities, or for initiating them if he did not find what he wanted on the program. The ground rules permitted walking out on any speaker or session, and entering sessions late. They permitted attending a seminar on some days and skipping it on others when a competing activity seemed more useful. They permitted spending time in the library or dormitory room no matter what activities were scheduled at that hour. This was an attempt to get away from the rigidity of 1964 where participants felt some obligation to sit still for whatever their instructor arranged. There were risks in this freedom. An instructor or consultant feels rewarded when he attracts and holds a large audience, and there is a temptation for each instructor to try to "sell" the activities he organizes. Happily, this was never carried beyond the point of good-humored competition. With our many competing activities we left the way open for the social crisis of a consultant prepared to meet a seminar and finding himself with no takers, but this never happened.

The directive that participants should come and go as they judged most useful had been the ostensible rule in 1964, but it did not "take". As nearly as I can judge it worked in 1965 because as director-instructor I was on the scene regularly and repeated the rule until it was believed, and because the 1965 instructors accepted it more, feeling responsible for the conference as a whole rather than for one segment. While the idea of individual responsibility did take hold, we were short of Utopia. Says one participant: "It was difficult enough to decide which of several simultaneous events to attend; the alternative of attending none

at all seemed most unattractive and a little dishonest. When I finally did start to go to the library and attend only one seminar, I felt some social pressure from both participants and instructors." And, as will be seen, many participants feel that they grabbed too varied a diet from the conference smorgasbord.

On paper, the conference day had a neat plan. At 8:30 there was one general meeting and no competing activity, so that every participant who wished could hear the visitor of the day and identify mutual interests to be followed up in later conversations. Then there was to be a coffee break and conversation period. At 10 in the morning seminars began, with two or three operating simultaneously. The visitor met the seminar for which he had been invited or, if that was scheduled for the afternoon, held an office hour. Participants were urged to use visitors as consultants regarding their personal research. There was a second seminar-or-consultation period from 1 to 3. The 3:30-5 period was to be left open for occasional miscellaneous meetings.

What happened was rather different. The late afternoon gradually became filled with participant-generated seminars, demonstrations, and other activities. The morning 50-minute talk often went on for 95 minutes, with the speaker finally being dragged offstage so a seminar could begin. There were other days when the speaker's second paragraph triggered so many questions that he was still trying to deliver Paragraph 3 at 10 a.m. While on paper the 8:30 hour was preempted by the general meeting, toward the end of the conference there were competing (subrosa) sessions of groups who could find no other time for a topic they wished to pursue.

The informality of the talks had both good and bad features. In the first weeks we challenged the speaker whenever any of his remarks was puzzling, and interrupted with purported insights suggested by his remarks. This made the sessions lively, and set the stage for true interaction and critical analysis rather than passive reception. This style shocked the non-American members of the conference, who consider it an affront to interrupt a speaker, and in several cases it prevented a provocative speaker from developing his theme. Midway in the conference we settled on a useful rule: The speaker could be interrupted only with questions of clarification during the first forty-five minutes, after which no holds were barred. Says a participant: "One of the joys of the conference was the general atmosphere of intellectual vigor and honesty that prevailed. There were very few privileged communications or persons; ideas had to stand on their own merit no matter how prestigeful the speaker."

There was, as planned, a formal reshuffling of seminars every two weeks, with a decision to continue or discontinue each seminar. A list of eight to ten seminars was issued and each participant indicated his preferences. The preferred seminars were formally scheduled. Some of the leftover topics were scheduled for late afternoon. The description of each of the regular seminars given below was prepared by the instructor in advance; sometimes the topical emphasis changed as the seminar proceeded.

First two-week period

Thinking (Reitman). Problem solving, concept formation, and concept learning, emphasizing models of the cognitive structures and processes involved, and simulation and heuristic programming as investigatory techniques in this area. Introductory overview.

Language (Lambert). Second-language learning and bilingualism, considering aptitudes, attitudes, and motivations as they affect acquisition and use of second languages. (In the event, first-language learning was emphasized.)

Motivation (Cronbach). Attitudes and motivation in higher education. Emphasis will be upon investigating development of attitudes, values, etc. as a function of college experience.

Instruction (Glaser). Investigations of the design of instruction, emphasizing cognitive, subject-matter aspects of academic attainment, analysis and control of educational goals and processes. There will be discussion of machine-systems for instruction and instructional research.

Second two-week period

Aptitude (Cronbach). Transfer as an objective in recent curriculum experiments; measurement of learning rate and amount of transfer; experimental evidence on learning to learn, aptitude-treatment interactions, cross-task correlations of learning rate. Paradigms for identifying aptitude-treatment interactions.

Thinking and simulation II (Reitman). Selected applications of information processing ideas in study of problem solving, development, learning, affect, and attitude.

Development of attitudes and stereotypes (Lambert). A review and discussion of some problems concerned with the development of social attitudes and stereotypes, its typical course and its possible modification.

Second-language learning and bilingualism (Lambert-Fishman). Notions and research on how second-languages are learned, and how one proceeds to bilingual skill. Social and psychological aspects of second-language learning and bilingualism.

Intellectual development (Smedslund). How to diagnose the presence vs. absence of particular concepts or structures. The problem of situational and personal generality of the findings. Attempting to construct a theory for a single child. The respective roles of external and internal reinforcement. The initial conditions for the occurrence of intellectual development.

Learning and instruction (Glaser). An examination of issues in learning to be followed by sessions on the strategy of translating from learning research to instructional design. Postman on interference, learning to learn, and mixed list strategies. Premack on reinforcement theory.

Third two-week period

Evaluation of educational programs (Cronbach, Glaser). Consideration of Scriven, Cronbach, Lumsdaine, Bruner, Bloom on strategy of evaluation. The horse race vs. the time-trials design. Taxonomic theories of educational outcomes; Bloom-Krathwohl, Guilford, Gagné. Criterion-referenced measurement. What concepts of validity apply in evaluation. Instruments and procedures used in recent curriculum studies.

Cognitive development (Smedslund). The problem of the relative importance of learning and equilibration. Discussion of the conditions initiating developmental change.

Verbal learning and written instruction (Glaser, Rothkopf). Studies of verbal learning and syntax; methods and problems in the study of written instruction; discussion of application of results from verbal learning to written instruction; some fanciful ways in which written instructional materials might be used in schools.

Information processing approaches to motivation (Munsinger, Berlyne). Cognitive-information processing factors that might be related to intrinsic motivation. Theoretical and empirical work of Berlyne, Kagan, McClelland (adaptation-level theory) and some communication theoretic notions. How might we tie these thoughts to the development of a system of motivation independent of primary drives? What forms might these theories take, what is the evidence (or type of experiment) that might point towards such theories, and what empirical evidence now is available to support them, if any.

Thinking and simulation (Reitman). Sessions on Simon's current work; simulation of organizations; of developmental processes (Hormann); of concept learning, memory, induction (E. B. Hunt); evaluation of validity of simulation models (E. B. Hunt).

Bilingualism and 2nd language learning (Lambert, Fishman). Sociolinguistics. Natural variation in use of 2 codes (both known to interlocutors), reflects variation in definition of "situation", social relationship, topic, etc. Extension of traditional psychological and linguistic descriptions of switching between codes (languages, dialects, registers) by attending to social structure and social process.

While the other instructors were primarily seminar leaders, Wiley was given a roving assignment. He sat in on nearly every seminar for a part of the time, commenting on methodological and statistical issues inherent in the discussion. Sometimes he was asked by the seminar leader to take responsibility for a technical subtopic. He provided individual consultation and gave talks or arranged discussions on topics pertinent to groups of participants. This statistician-in-residence role worked out very well. Apart from the direct value of his technical advice, Wiley contributed a good deal just by being free to visit back and forth

between groups. It has been suggested that the conference would have been strengthened further by the addition of a sociologist-at-large, who could cast a special light on many of the topics discussed.

While the schedule in Appendix A lists all the sessions that were posted as part of the official program, there were many activities that I learned about only after the event. I am therefore unable to list all the individuals who visited the conference and contributed to it, often without hororarium. We do thank all the contributors, named and unnamed.

During the first three days of the meeting, each instructor gave a talk about some of his own research or thinking which provided a preview of one of his seminars and helped participants to know him. Later, each of the five instructors gave a lecture on the Stanford campus. This was arranged partly to spread interest and understanding about the topic, and partly to repay the Stanford community indirectly for its support of the conference. As in 1964, audiences declined from week to week, as summer-session students became busy with their assignments. Each week's lecture drew a different audience, which suggests that the series had little impact. Being open to the conference members, the lectures extended the conference program. We decided not to arrange for a publication of talks and lectures comparable to Learning and the Educational Process edited by John Krumboltz using 1964 conference talks (Rand-McNally, 1965). So many collections of heterogeneous papers on education or cognitive processes are now reaching the market that a second set of conference papers seemed a doubtful investment of effort.

We urged participants from the outset to avoid overscheduling themselves, to save time for reflection, reading, writing, research planning, etc. The conference developed a spirit, however, in which it was unthinkable that a participant should spend three to four hours in meetings and an equal time by himself. In every session at least one topic was mentioned in passing that some eager beaver would propose to amplify into a two-hour session. (Sometimes the eager beaver was the instructor.) Neither the instructors nor the conference director could legitimately veto a proposed extra meeting. The only protection was the fact that no one had to attend a scheduled meeting, and a rare meeting did disband for lack of attendance.

Attempts to keep instructors from overscheduling themselves likewise failed. I tried to persuade some of the instructors to work at large as Wiley did, scheduling no seminar for themselves for a two-week period. What happened, on the contrary, was that every instructor was running one seminar each day, running or participating regularly in a second, and sometimes running a third group in some odd moment. The instructors did this partly out of their enthusiasm for their topics, partly because the participants were insatiable, partly because they found the interaction tremendously valuable for themselves. As one instructor said, "This conference is just a device to enable the instructors to get an education." At one time or another, every instructor was working in a team relation with another. Sometimes this took the form of a jointly led seminar, or of each man attending the other's seminar and participating vigorously. The net result was a crossbreeding of ideas that rarely takes place on the campus where a man's classroom is his private preserve.

While I remain amazed at the stamina with which the instructors worked with participants for 40 hours a week, and the matching stamina of the participants, this does not tell the whole story. There was considerable out-of-hours activity: singing into the wee hours, visiting local folk-dancing groups as many as four evenings a week, swimming, Go, and other forms of conviviality. It was a youthful conference.

We have wondered about conference length. There are some who, in retrospect, think that the conference could have been shortened to four weeks, but the overwhelming majority favor six weeks* and several recommend eight weeks with the seventh week entirely empty of schedule so that participants could organize their notes and ideas and come back the eighth week with research plans and draft papers. This sounds like a scheme worthy of experimentation. A suggestion something like this for the sixth week of the 1965 conference ran afoul of the enthusiasm of the seminar leaders, each of whom had material he wanted his group to cover in the last available days. For similar reasons the conference also ignored the option of having any seminar meet only three days a week, using the time on other days for reading and writing.

One aspect of the conference organization collapsed early. "Home groups" were set up, each with an instructor plus about ten advisees. This group was expected to meet together during the first two weeks, and from time to time later. My purpose was first to make sure that no shy person was lost in the drift of forty strangers, second to make sure that some instructor became familiar with the participant's special interests and helped him shape his program of activities, third to provide a forum where the participant could present and reshape his research plans. The home groups met for a few sessions, but each of them disbanded before the second week ended. The system collapsed because I made two mistakes. The first was that I failed to interest the instructors in home groups; their emotional investmant was all in seminars, and their lack of investment in the home group was demonstrated by the fact that one, at least, dismissed his group after ten minutes with the (sincere) injunction, "If you have any problems, come see me individually." Second, it was a mistake to form the groups with heterogeneity in mind (though each participant was given one of his two first choices as adviser). My idea was to make sure that the "pure" experimenters were thrown into a group where applied problems would be discussed, and that the "applied" workers would be influenced by participants with theoretical sophistication. I also thought that a mixture of substantive background would lead to new insights. The group were so diverse that only a fraction of the home group was interested in a given participant's problem. Some members seemed to resent being asked to listen or to make a report to persons with alien interests. The hope that regular seminars would give an opportunity for the individual to advance his own research was only sporadically realized,

*There is reason to think that a four-week conference would be more suitable if held in Europe in the next few years.

depending on the aggressiveness of the participant and the coincidence of his topic with that of the seminar. Nor did participants often seek out instructors to talk about their research plans, even though this was urged. This would have been remedied by systematically posting office hours with signup sheets for appointments, and perhaps even calling participants in for talks. As to the home groups, I think we might have done better to constitute them after ten days of the conference, using a sociometric method.

One device sprang up only in the last week. Hours were set aside in which any participant could reserve a room and post a notice inviting others to hear about and discuss a stated research plan or problem arising in his work. This seemed to work well, and should have been tried earlier. While the option had been mentioned at the start of the conference, such sessions did not happen until the option was institutionalized by setting aside empty hours for it. This illustrates the limitations of self-direction. An even more striking illustration is the insistence of one participant that what the conference needed was a daily period of two hours or more allocated for study and writing, with no meetings permitted. While anyone could have so scheduled himself, there was always the fear of missing something. Whatever the conference schedule firmly institutionalized took place; what was left to spontaneous organization was likely not to be realized.

A special feature of the conference program was the information about computer-aided instruction provided by the International Business Machines Corporation. They installed, at their expense, a student-response terminal wired to a computer in Yorktown Heights, New York, so that participants could have first-hand experience with the COURSEWRITER system and could draft instructional programs if they wished. They also arranged a tour of the development laboratories at Los Gatos, California, and provided a speaker on their C-A-I system. We are most grateful to Mr. Carl Spring and the other IBM representatives for their efforts on our behalf and their interest in the conference.

Finally, I note the important contribution made by Howard Hjelm of the U. S. Office of Education and Howard Hine of the National Science Foundation, who visited for a day to explain the programs of those agencies to the participants and to discuss the individual plans of participants. The candid discussion of agency interests and review arrangements these visitors gave was of great value to our less experienced researchers. Many of our overseas participants were interested in American arrangements for research support even though they themselves are unlikely to be eligible for contracts or grants. Observers from Puerto Rico (Angel Quintero Alfaro, the Commonwealth Secretary of Education, and Augusto Bobonis, Dean of the School of Education, U. P. R.) attended for ten days each, with a view to using some of the conference techniques in Puerto Rico.

Participants. The chief impetus to setting up the 1965 conference was the large number of good applications rejected in 1964 for lack of places. Our expectation that there were further worthy participants to be attracted was borne out. In 1964, we provided 40 places and had about

160 applications. In 1965 we announced 35 places and had about 140 applications. This drop in applications is of little significance. It reflects the lack of an APA announcement, plus the fact that a person rejected in 1964 was highly unlikely to apply in 1965.

I judge that the quality of the 1965 participants was equal to that in 1964. This equality was achieved, however, by bringing in overseas participants. The 27 Americans accepted roughly matched the range of the 39 Americans of 1964. The 10 accepted from overseas were a highly able group, on a par with the ten best of the Americans. The small number of overseas places made it necessary for us to be highly selective.

A good indication of the quality of the applicant pool in 1965 is found in the persons who had rated fairly well in 1964 and been eliminated in the last stages of the competition, and who reapplied on my invitation. Most such applicants, when rated in 1965 by a largely new group of reviewers, stood at just about the same place in the competition, being rated in the lower group of persons accepted or high among those rejected. (Certain striking exceptions in this repeat-application group were very well regarded either during the 1965 review or as the conference unfolded.)

There is no reasonable basis for comparing the foreign applicant pool as a whole to the American applicant pool, but there is ample basis for concluding that there are a large number of young researchers overseas whose interest in complex learning and motivation, or in educational problems per se, promises to make a substantial contribution to the field. So much are we impressed with the potential of this group that the SSRC Committee is exploring the possibility of organizing a Conference of this general nature in a European setting for 1967.

The reviewers tried to select the applicants who were most promising as scholars and who seemed likely to profit most from the conference. An excellent scholar might be rejected if his plans seemed too set to be influenced, or if his interests seemed too far outside the topical range of the conference. Preference was given to persons with some postdoctoral research experience. While in 1964 we had some unusally mature predoctoral applicants who had considerable research experience, in 1965 the predoctorals were generally inexperienced and the conference may have come too early in their careers to be of maximum benefit.

As is to be expected, when asked what type of participant is most likely to benefit from the conference, the participant defines that group to include himself. And many make the point that a range of age and background is important to maintain. The odds are, however, that the greatest growth will be shown by the person two to six years past his degree, who comes to the conference with a definite interest in some problem but with considerable openness about research strategy and hypotheses. If he has some dissatisfaction with the cumulative product of his work to date, that helps too. The person who is merely drifting

in search of something to investigate is tossed like a chip on the changing currents of the conference. The person who is well set in his line of research and content with it has little to gain save an audience. The criterion is not age or area of training. It is youthfulness of outlook, combined with maturity of interest.

In the end, we invited 37 people to the conference. The original quota of 35 was extended by some budgetary cheeseparing, and by the fact that a few participants were able to obtain part of their expenses from their home universities.

While promising persons in the applicant pool had to be rejected, we cannot say, as we did in 1964, that there were enough promising American applicants to fill a second conference. There is a point of diminishing returns in training. We cannot ask our most talented researchers to give up time to staff training institutes unless we can assure them that they will be working with a group that is really likely to do significant research. I am not at all sure that another American group as good as our 1964 and 1965 groups could be assembled in 1966, even assuming that proper time for recruitment of participants were allowed. I am sure there will not be enough blue-ribbon applicants to justify more than one conference of this sort per year in the immediate future. (The Wisconsin conference was of another type, designed to give training in statistical methodology rather than substantive. Our experience does not bear on the feasibility of further conferences of that type.)

The complete list of participants, with descriptive information, appears in Appendix B. The participants covered the range from pure experimental psychology to applied research in education; nearly all were psychologists, but their interests and competences were extremely diverse. For some reason, the Conference attracted almost no researchers with a direct commitment to curriculum research and improvement of instruction. The educational psychologists are interested in establishing general principles of instruction and classroom learning, but we had just one person working in mathematics education, and a few doing operational studies of college student bodies, to represent strictly pragmatic interests. In 1964 we had several excellent participants who combined good research training with a commitment to field research on subject-matter learning, often within a major curriculum project.

Library. The library was a vital part of the conference. It contained about 700 items ranging from handbooks and encyclopaedias to prepublication reports and even draft manuscripts. These came largely from the personal libraries of instructors, since the Stanford library collection had to be kept on the main campus for summer-session use. An important part of the supply consisted of books shipped to the conference by the participants. Third, many consultants brought a set of reprints with them or, more foresighted, sent them ahead. This heterogeneous collection was extremely hard to keep track of, but Mirian Betensky did very well at cataloguing and managing it. The Stanford collections were also available to participants, a half-mile from the conference site.

These arrangements were effective, but scarcely ideal. In particular, there were too few copies of books instructors wanted to assign. Perhaps a book allowance of $25 per participant should go into the budget. One participant suggests that the most useful books be purchased in quantity, used as a library, and sold to participants at a discount when the Conference ends.

Housing. Conference housing, both for business and living, was much more satisfactory than in 1964. Stanford University has a complex of new fraternity buildings on the edge of the campus, two of which we were able to use. The first provided comfortable meeting rooms and instructors' offices, though some meeting rooms were too small. Stanford charged the conference on a per-room-used basis; we had budgeted for this, but in retrospect enough money should have been added to provide working space for participants. The ideal, according to participants, would have been a desk for each person, in a room shared with only two or three others. We had assumed that participants could use their living quarters for study and writing, but this seemed not to work well. While ten rooms or more for study would have been unreasonably costly, even a couple of rooms for quiet reading would have been an improvement over our traffic-filled library.

The majority of participants lived in a second fraternity and took their meals there five days per week. The remainder scattered through the community. There is a strong consensus that those who lived at the fraternity gained much more from the conference than the others, thanks to day-and-night shop talk. (To be sure, a few of those who lived elsewhere say that this made no difference.) The related question is whether to bring wives and children. Here there is a more or less gallant division. No participant who brought a wife reports that it was a mistake; no one who left his family home says that the conference would have been just as profitable had they come. It is evident that the person who came alone could do more reading, studying, and shoptalking and that the man with a family found many activities to share with them. The man who came with only a wife apparently could work with little distraction save that of his own choosing; the one who came with younger children evidently "lost" a good many hours to recreation or home confusion. While one could argue that the conference would accomplish more if families were not accommodated, the fringe benefit of a family vacation in California attracts applications and so makes it possible to select better members than a conference run on monastic lines would draw.

The conference could not possibly be as successful if not held in a place with attractions such as the Bay Region offers. Not only did this get us better applicants, it helped immeasurably in our difficult quest for instructors and consultants. There were a number of instances where the opportunity to come to California even briefly was the deciding factor in acceptance. A major University provides an excellent resource to draw upon for speakers. At Stanford we have the additional advantage of the Center for Advanced Study, whose scholars and staff contributed to our program in numerous ways.

I advise organizers of other conferences to keep participants living in the same building, or at least the same neighborhood. Ours were scattered over a twenty-mile radius. A lot of the vitality of our conference was centered in the housing unit that benefited just about half the members.

Effectiveness of the conference. Some evaluative remarks have been inserted earlier; we are now ready to consider more systematically how the conference seems to have worked. Fortunately, the participants took quite seriously my request for candor, and I therefore have a good deal of information on shortcomings or, more justly, what possible outcomes were sacrificed to the attainment of others.

The discussion is organized around this list of outcomes:

1. General acquaintance with significant current work, and comprehension of the state of the art.

2. Mastery of the intricacies of at least one topical area; development of competence in depth.

3. Identification of studies worth doing, development of plans.

4. Getting technical criticism of one's past or planned work.

5. Motivation to do research. Motivation to concern oneself with education.

By way of overview, I would answer whether each of these was achieved as follows: 1, strongly yes; 2, generally no, yes for a minority of participants; 3, yes for most participants, but little detailed planning; 4. only in limited way; 5, strongly yes on motivation for research, but not particularly toward education as such.

1. The participants were highly attracted by the opportunity to listen to a broad array of speakers, and to be introduced to diverse and up-to-date readings. To quote two of them:

> I have so many ideas and enthusiasms at the moment that there is not room for all of them to survive and flourish, and I can only guess which are the fittest. I believe the conference will prove to have been a major event in my professional development, and I deeply appreciate the opportunity to participate. I have been going at my present studies in a rather narrowly limited fashion. The chance to get away for a period and re-examine what I am trying to do has had the effect of changing my perspective, and this inevitably must be followed by a change in my research behavior. For this

reason alone I would say yes, the conference was profitable for me. Not only did it enable me to broaden my perspective, it has also given me a whole constellation of related ideas and directions from which to choose.

I had intended to read in one area, the affective domain, while at Stanford. While I did make a dent in the reading, I spread my time too thinly to accomplish my plan. However, I was exposed to certain important areas of psychology for the first time, and achieved deeper insight into previously familiar areas. After two years of starving for intellectual stimulation, this effect was well worth forgoing the in-depth reading.

An important side-effect of the conference for the overseas participants was that several of them arranged to visit American laboratories before or after. For one, at least, this was more valuable than the conference (he being one of those whose interests were more in motivation than in learning). For many participants, the sheer opportunity to meet colleagues with similar ability and interests was a prime value of the conference.

2. A schedule that tried to deal with an area in two weeks required superficiality. The issues were often at the absolute frontier of current knowledge, and many a speaker got into the knottiest detail of the frontier work, but the shifting of topics, the limited opportunity for homework, and the uneven familiarity of the group members with the topic at hand made this a hit-and-miss exposure. Even in those seminars that pursued an area for four to six weeks, there was considerable of the same superficiality.

The group that best overcame this difficulty was Lambert's, dealing with bilingualism and second-language learning. The conference drew several participants already deeply familiar with the area and needing to work together. Even so, the group seeking a narrow concentration on second-language learning had to satisfy itself outside the main seminar. Lambert and Fishman aimed to expose the group to the variety of thought in modern linguistics, and many of the seminar participants were interested more in reading or verbal learning than in bilingualism. The bilingualists did achieve their ends, within the limits allowed by their own appetites for a broad education. They will constitute an international network from now on, and have already committed themselves to produce an issue of the Journal of Social Issues on bilingualism, a topic critical in developing nations and also in New York City and Montreal. The diverse reports on linguistics

fascinated the group. There were probably too many of them; some participants seem to have picked up fragments of conflicting theories rather than a consolidated understanding of any of them. Perhaps the main achievement of this seminar was to make clear how radical are the implications of Chomskyan linguistics, forcing each participant to decide whether he would make a major effort to reshape his research on language learning or would, on considered grounds, reject the Chomsky approach. To have gone further, and become familiar enough with any one linguistic school to use it in research planning, was not manageable in a six-week meeting.

We were set up to go into depth in computer simulation, but only a few participants chose that option. Most members wanted to inspect the approach from a cool distance, to decide if it is promising. The Simon-Reitman message, that one cannot appreciate computer simulation of thought even as a metaphor for psychological theory until one has learned a list-processing language and experimented with it, evidently got across to very few. In effect, half-a-dozen participants say, "Only at the end of the six weeks did I grasp how much painstaking, concentrated work this approach demands." The participants who settled for a superficial look say that it was of value. A few report getting a great deal of help on their own research, finding a compatibility between this new methodology and some old and complex problems. One will follow up this initial exposure with a two-week visit to Simon's laboratory.

Still another subgroup that had ample opportunity to pursue a theme exhaustively was concerned with computer-aided instruction. The main activity was outside the regular seminar stream, in the late afternoon sessions with the Stanford group and the IBM facility.

In retrospect, the seminar pattern with the ground rules allowing sporadic attendance served very well to educate the participant and extend his acquaintance with usable ideas, but it did not promote depth. The open door meant that some seminars were too large. There was evidently much redundancy in the discussions. Some of this was entirely to the point, since a fresh idea is not adopted on one exposure.

But it seemed all too easy to bog down in metatheory, a ground on which all participants are equal. Every psychologist carries a metatheoretician's shovel in his knapsack. "Can Stimulus-Response theory handle complex learning?" was discussed over and over. This came about because "SR Theory" was used as a whipping boy by a few consultants (who could have described their own thinking without this polemic.) Their overstatements ran counter to the conservative beliefs of some other members of the conference, and the stage was set for obsessively recurring disputes. The matter did abate, thanks to the good sense of such persons as Postman who placed primary emphasis on the problem to be understood and secondary emphasis on doctrinal issues. Simple formulations explaining overt responses in terms of external stimuli are quite inadequate for the learning that interests today's experimenters and educators; recent work on grammar and rule learning, on cognitive stimulation, and on attention processes made this clear. The basic question of

finding a usable language or theoretical system for describing internal processes, which is significant for all "schools", was distorted when the debate centered on whether something called "SR theory" could account for these processes.

While discussions often lacked depth, the questions considered were deep enough. If the answers were vague or incomplete, this is because the questions raised are so new that answers could not be presented, or developed in short order. There was an astonishing amount of strictly new material presented. To list only some examples I know most about:

> The evaluation group was able to profit from, and go beyond, a conference of leading workers in the field that two instructors had attended in April. The summer group considered the special requirements for a criterion-referenced scale, the evidence required to validate a taxonomy (with Bloom as consultant), and the division of effort between formative and summative evaluation -- all topics totally new to the literature.... Tyler reported the plans for a National Appraisal of Educational Quality, going into detail well beyond publicly available information and frankly discussing the danger that such data may be misused.... The seminar on aptitude examined the whole history of psychometric studies of learning rate down to the latest publications, then had an appraisal from Tucker of the techniques that had evolved (largely under his direction), including a critique of the latest study by Bunderson. This unique study used cognitive simulation to generate a psychometric hypothesis. Two days later, Bunderson himself was on hand to present and discuss this study in detail.

Each such presentation brought participants down to the minute and identified the problems that still need solution; it is not too surprising that the solutions remain as unfinished business. Says one worker with a well-defined problem:

> The consultants themselves and their unpublished work gave me information that is vital to my research program. It would have been years before these developments reached my attention through the normal channels of scientific communication.

3. The exposure to participants, instructors, and consultants with a wide range of interests made it easy for the participant to extend and redefine his own research interest. Here is a fairly representative account:

> First of all, I received useful feedback and encouragement on a theoretical paper concerned with conceptualizing the process of social reinforcement. Secondly, I received a great deal of help from a number of people concerning our project working with school dropouts. Thanks to the encouragement of the attitude seminar, I am going to prepare a paper comparing dissonance theory to other "consistency" models of attitude change. I was also considerably helped by Wiley in selecting powerful analytic procedures for a pilot study using my social-reinforcement model.

Another writes:

> As a result of the conference I am devoting all my research attention to bilingualism, and I have been able to plan four experimental projects in the two weeks since I returned. I have nearly completed the apparatus to be used in two of the studies.

4. Only a few participants had a good chance to lay out their past or current research and get thoughtful discussion of it. Perhaps the most successful experience was that of a participant who arranged for Postman to take some of his draft papers home for study and discuss them on a later visit. This worked out because Postman came to the conference on three well-spaced occasions, an arrangement that could have been advantageous with other consultants from nearby. Perhaps one could pay the distant consultant for two extra days spent before coming to the conference in reading papers submitted by participants. While each of the regular instructors did some reading of papers by participants during the conference, and discussed them carefully in individual conversation, participants were shy enough that not all of them took advantage of the opportunity. The tendency of the instructor to overschedule himself with meetings, and the home-group failure, also were responsible.

I think it would have been a mistake to spend a lot of time in detailed critiques of the research plans the participants brought to the conference. Over the six weeks many of the members shifted their aims, either toward a more theory-based program of studies or a program that brought in new variables and techniques. To have spent time on their initial formulation, and so deepened their commitment to this often-limited study, might well have blocked them from the assimilation and redirection that went on. By the end of the conference, but not much before, members were ready to assemble their new ideas into a plan of action.

5. We observed as in 1964 that highly able young researchers need the encouragement the conference offered. They often fail to realize how good their potential is, or that their ideas are significant and worth developing. The mere fact that they were selected for the

conference does something; the interaction does much more. These remarks are made by a man trained in a first-rate, research-oriented American department and now in a major University in a highly developed country:

> Most important, the conference stimulated me for more research and productive work. When I left the U.S. four years ago I was fully motivated and ambitious to lead the world in the educational application of the psychology of thinking. Back in my country which is eager to absorb foreign knowledge, however, I found that the role expected of me was that of interpreter rather than that of productive researcher. The knowledge I gained in the U.S., e.g., test theories, programming and computer simulation, concept learning experiments, neo-Piagetian approaches, etc., were new and attractive to my fellow educational psychologists at home. Presenting introductions, reviews and comments in publications and lectures gave me a reputation and a good income. What is dangerous about doing this for an audience who are not sophisticated enough is that in order to communicate, one has to structure, sacrificing details, ignoring contradicting facts and sometimes appealing to dangerous analogies. It was a path to being a Reader's Digest reviewer or a rural normal-college lecturer.*

> The conference made me aware of this. Talks given by leaders of our science and discussions with keen young researchers made me appreciate the chaos our science is in. There are a lot of things yet to be solved or yet to be explained. It gave a strong feeling of duty and challenge. The talks and seminars were organized so that the chaos was presented with no feeling of despair but rather with a pleasant feeling of challenge. I realize that the chaos is there, but also realize that systematic attacks against this chaos are just starting. I am proud of being potentially a part of this attack. I do not think that I can give up my teacher-interpreter role, but I am determined to spend more time in exploration and research, and hope to stir the same motivation in my students.

The conference did little to shift persons out of pure psychology and into applied educational research. (Should it have?) Evidently, the speakers coming out of pure psychology made a stronger impression than those who reported applied studies. The educational psychologists in the conference now tend to regard their own past work as staying too close to practical problems and making insufficient use of theory; while

*In the U.S. also, ninety percent of the Ph.D.'s in educational psychology follow this path (LJC).

they may continue to collect classroom data, their eyes will be turned more to basic interpretation and less to immediate engineering applications. The experimental psychologists in the conference speak with respect of the work being done in educational applications, but seem to feel that their contribution will be greatest if they stay with highly controlled studies of well-defined variables. One of them plans a book to show the educator how much of classical learning theory can be turned directly to use. Here are pertinent comments by five others:

> With reference to a continuum from pure psychology through education, I started the conference with a tenuous foothold at both ends of the scale but now, working in terms of basic processes, I can range up and down the continuum much more easily, and certainly I no longer have that uneasy feeling when at the educational end that I am wandering too far from pure psychology. I think this greater facility in considering educational problems is due in no small part to the wide range of interests represented at the conference. Listening to Postman and Andreas apply their findings on paired-associate learning to education was partly reassuring that the verbal learning field was not of as limited generality as I had feared, although I still have reservations about whether much learning really consists in forming associations between discrete elements.

> The conference generally influenced my research by breaking through a number of behavioristic restrictions which I had long taken for granted. Problems which previously seemed beyond the pale, now seem highly researchable. I have mentioned the specific ways in which my research in the near future was affected; it is more difficult to directly state the numerous influences which lead to subtle shifts away from or toward a topic of research -- the overall effect was on my horizons. As a social psychologist doing research in the schools, I began near the middle of the pure-applied continuum. The conference acquainted me with theory underlying educational practices and methods of evaluating them outside the social psychological one with which I am most familiar, so it did move me toward greater involvement in the problems and techniques of educational psychology. I would say the primary effect of the conference on my own research career has been renewed interest in long term study as opposed to the short-term experiment. I am impressed by the empty-headedness of much of our research in

psychology which purports to do something to the subject in 15 or 20 minutes. I had thought of moving more in the applied direction with perhaps less rigorous experimental methods or more tenuous theoretical implications. Instead I think I have found some interesting theoretical basis for the study of reading and will therefore stick closer to the laboratory and to foreign language materials.

I've become much more impresssed with the sophistication of educational researchers and with the enormous difficulties involved in research in the classroom. I plan within the next couple of years to acquire a nursery-elementary school and to use this school as an experimental population from which to sample and manipulate, gaining information on many variables simultaneously.... I was more or less a pure psychologist when I came to the Conference, and I am still a pure psychologist in the sense that I am interested in theory building and research, but the type of theory that I want to build hopefully will have more relevance for education than some of the ones that we've had in the past.

I had just completed a degree with emphasis on measurement. Prior to the conference, I had planned to pursue the field of measurement. I now plan to develop my interests in training and instructional materials, with the hope of applying my knowledge of measurement. In essence, the conference has influenced the direction of my research.

I found most valuable sessions in which we examined even the most basic assumptions that are usually made in designing instructional systems. It is now clear to me that there are large gaps in the body of psychological data and theory, gaps that must be filled before Glaser or anybody else will be able to develop a meaningful educational technology.

Manifestly, our participants were moving during the conference, but not in the same direction. Much of the conference agenda, overt and covert, had to do with "What research is of most worth?" The members came up with rather diverse answers, but only two or three still believe the studies they were committed to before the conference fill the bill.

We may now try to draw some conclusions. One of the greatest problems of the conference was diversity of interests. This meant that no seminar could assume a common background. It meant that any discussion might turn off in a dozen directions, depending on who was moved to command the floor. It meant that considerable searching was required to locate common interests. Each participant had so many interests that the listings distributed and the home room talks could not expose them all. This leads many participants to suggest that the topical range of the conference could well have been reduced -- though others resist any reduction.

We hit the upper margin of allowable diversity of interests; I would not advise much reduction. For one thing, when participants report what they got out of the conference, each one seems to have assembled the diverse elements in his own idiosyncratic way. To define an area of (say) "intellectual development in early childhood" would be to suggest a group of consultants and seminars that surely would not cover simulation of thought processes -- yet that was precisely the needed ingredient for one member's synthesis. To stay with meaningful learning and reject studies of nonsense syllables would seem equally reasonable; yet findings on rote learning advanced the thinking of many of the most "educational" psychologists. When each participant names those he found especially helpful there is no discernible clustering; our Brownian movement allowed each person to find an idiosyncratic assortment of models.

There was one major error in my arrangements, and I report it as a cautionary tale. We had not included motivation among the advertised topics for the conference, though we had included attitude formation. When the applications came in, we found a striking cluster of good persons interested in motivation of college students, need for achievement, and related matters. To "meet their needs", I asked T. R. McConnell to organize a seminar, to run for two weeks at the start of the conference. He agreed, with the understanding that I would "sit in" and coordinate so that he need not attend regularly. Then he underwent two eye operations and was lost to us. Paul Heist, a senior member of his Center, while not free to take over, did help me plan a seminar staffed entirely by short-term consultants. While I have done some recent research in this area, I have not concentrated on it and could not literally direct a seminar. For reasons I cannot fully trace, the seminar flopped. While the consultants did just what I asked, and some are spoken of highly in the final evaluation, the net effect of the seminar was to reduce respect for the type of research common in this area. The reviewers had said, when they selected certain participants interested in college studies, that as individuals they looked like competent researchers but the studies they were doing seemed relatively trivial. Whether this preconditioned me to run a suicidal seminar I do not know. I do know that the participants agree with me in evaluating the seminar as of little constructive value. Two of them are moving now into strikingly different research areas, and four of them have formed a team to do some theoretically based research on attitude development in college -- failure may only be an unusual form of success. Nonetheless, I conclude that for a conference of this nature no one should lead a seminar in a field where he is not thoroughly <u>au courant</u>.

We had too many consultants; the large number of consultants was an attempt to repair the shortage left by the collapse of the two-week instructor plan. Consultants did not plan their work as instructors did, however, and they often detracted from the continuity of the seminar. With fewer consultants there could have been more study of the man's work in advance of his visit. The morning talks open to the whole conference became too numerous. They provided precisely the partial reinforcement that is most frustrating; there was enough unexpected payoff in the talks that the member rarely dared to ignore the next day's talk, even when the speaker was unknown to him and the topic alien. To quote a participant:

> As long as the big names are there, they are almost irresistible; many of us tried to read some of the more significant work of each before we heard him and this was very time consuming -- yet we felt we owed it to ourselves and the speaker. You have no idea how wonderful it was to find a speaker scheduled whom you <u>weren't</u> tempted to hear and the sense or lift you got from being able to devote the preceding evening and from 8:00 a.m. to 10:00 a.m. that morning to reading and writing directly related to a seminar.

It is hard to say what consultants could best have been omitted, as each one had his own impact on a selected group. With hindsight, it seems that the best consultant has three characteristics: he is well along in his program of work so that he has a good deal of insight and experience; he is willing to expose his puzzlements and dissatisfactions as well as to parade his successes; he does not duplicate what regular instructors can supply. Occasionally a "big name" is deficient in one of these respects; sometimes a very young man meets the requirements well.

We might have reduced the size of the conference. With 37 participants, no one got to know more than about 20-25 at all well, and we all regret the gaps in our acquaintance. I conclude, however, that the size was right. There was such interpenetration of groups that even the most isolated subgroup on language made many intimate contacts with others of quite different interests. To manage a conference of this size is not appreciably harder than to manage one of half the size. Bringing a large group provided for a serendipitous matching of interests that would be far less likely in a small group. There is considerable merit in the suggestion that a few narrow themes be established, with every participant committed to follow one such theme for six weeks and concentrating his reading there; leaving a couple of hours a day for talks or brief seminars on diverse topics. This proposal falls between our 1964 and 1965 plans.

With 35-40 participants, I recommend a staff of seven regular instructors, plus the director who should not carry a full instructional load. Some of these instructors might be used for just four weeks if that is their preference; the better pattern would be to have each man lead seminars for four weeks and to work "at large" for two weeks (or, in the case of a specialist like Wiley, to work at large most of the time). In addition, there may again be a conference participant or two who can double as instructor. The number of consultants who commit full days to the conference should be radically reduced. One consultant for each major topic, carefully chosen to complement the instructors, should come for two to four days. In addition, several speakers from the conference locality are likely to be worthwhile.

A number of participants would have liked to see more of a "product" from the conference. There was some tendency to plow up the ground without raising any crop. Various devices are proposed whereby, working more continuously over the six weeks, participants might have produced position papers or research plans. I would like to see this tried, but would not put much weight on such products. Many of us have new ideas we will mull over or collect data on in the next year; the products of such work will be more substantial than whatever might have been harvested in the few weeks after the conference "plowing" had made it possible for new thoughts to grow.

That is probably the significant phrase to characterize the 1965 conference. Few of the instructors or participants came with fixed ideas to be sold to others. While each one did try to communicate his understanding as developed to that point, there was a conspicuous openness to new ideas. Each instructor found himself with fresh ways of looking at his own research as a result of his interactions.

> From the conference I have not gained any quick answer to psychological problems, my own or anyone else's. Nor have I come away with well formulated "next experiments", although there are many ideas which will almost certainly crystallise into independent variables in the near future. But chiefly what I have picked up is a new perspective in which to view old problems. The concepts picked up to use in my thinking retain many of the flaws inherent in the terms that I have abandoned; there are times when the differences between "encoding" and "association", for example, fade into obscurity. Nevertheless my new framework leads me to ask different questions and to look for different answers. Whether the experments so generated will yield useful information, only time will tell.

All in all, the conference was a lively, battery-charging, brain-charging experience. The credit for this goes to the enthusiasm and ability of the participants and instructors. I am convinced that, with time, valuable ideas will be distilled from the ferment of the 1965 Conference.

Appendix A. Log of Conference Activities, 1965

June 21	Registration and general meeting.
June 22	The study of language. W. E. Lambert The information-processing viewpoint. W. Reitman Preliminary talk on seminar plans. R. E. Glaser
June 23	The nature of aptitude. L. J. Cronbach New designs and new applications to educational research and future. D. Wiley Psychological bases for instructional design. R. Glaser
June 24	College environment studies. C. Robert Pace
June 25	Multivariate analysis of qualitative data. D. Wiley
June 28	Student characteristics: diversity and development. G. Yonge Tour to Los Gatos IBM plant
June 29	Chomskyan view of language. J. Fodor
June 30	Computer-based instruction and models for optimal learning. R. C. Atkinson The new demands on curriculum evaluation. Lee J. Cronbach
July 1	Assessing the effectiveness of instructional programs. A. Lumsdaine Studies of student discontent. Richard E. Peterson Cognitive factors in motivation. Harry Munsigner
July 2	Biographical and attitudinal characteristics of college students. R. Peterson
July 5	Peer influences on student development. T. Newcomb. Current work on verbal learning.
July 6	Studies of cognitive processes in children. Jan Smedslund. Perception and speech. A. Liberman. Computer-Assisted Instruction. D. Hansen and Lee T. Griffith
July 7	The science curriculum improvement study. Robert Karplus The development of children's images of foreign people. W. Lambert.
July 8	Research support programs and policies of USOE. Howard Hjelm
July 9	Training procedures in second-language instruction. Grace Yenikomshian

July 12 Training in convergent and divergent thinking. R. S. Crutchfield

July 13 Learning of codes and rules. G. A. Miller
The coursewriter system. Ed Adams
Implications of behavioral science for guidance. S. Bijou

July 14 Language universals. Joseph Greenberg
Experimental design in studies with contingent control of stimuli. D. Wiley
Human intelligence -- an information-processing approach. W. Reitman.

July 15 Psychometric studies of learning rate. Ledyard Tucker
Three-mode factor analysis. Ledyard Tucker

July 16 Reinforcement theory. David Premack
Machiavellianism. R. Christie
Teaching a chimp to talk. David Premack
The nationwide assessment of educational outcomes: the exploratory study. R. W. Tyler

July 19 Simulation of thought processes. Herbert Simon
An elementary view of Bayesian statistics. Albert Madansky

July 20 Some work on the experimental psychology of written instruction. Ernest Rothkopf.
A study of aptitude and transfer guided by a simulation model. Victor Bunderson

July 21 Motivation of perceptual and intellectual processes. Daniel Berlyne
Recent methodological innovations in educational statistics. David Wiley

July 22 Noncognitive variables influencing learning. Jerone Kagan
Research support programs and policies. Howard Hines

July 23 Child language: some questions and some answers. Charles Ferguson

July 26 Stability and change of individual characteristics. Benjamin S. Bloom
How can compensatory education programs for young children be evaluated? Benjamin S. Bloom

July 27 Evaluating simulations of thought processes. E. B. Hunt

July 28 Illinois studies of computer-based instruction. L. M. Stolurow

July 29 Verbal learning, retention, and transfer studies with presentation of whole list and free recall of items. B. Andreas.

Research on analysis of cognitive discourse in the classroom.
Philip Lawrence.
Seminar on attitudes
Instructors available for conferences at hours indicated on signup sheets. Please sign up.
Seminar on bilingualism
Instructor conferences
Seminar on sociolinguistic

July 30 Research along lines of Kagan expts on similarity of model to subject and model's influence. Daniel Neale.
General "Quaker meeting".
Seminar on sociolinguistics.
End of official business
Instructors meet.

Appendix B. Participants Attending the Research Conference on Learning and the Educational Process

Conference directors: Lee J. Cronbach and Richard C. Atkinson, Stanford University

Instructors -- Lee J. Cronbach, School of Education, Stanford University
Robert Glaser, Departments of Psychology and Education, University of Pittsburgh
Wallace E. Lambert, Department of Psychology, McGill University
Walter R. Reitman, Department of Psychology, University of Michigan
David E. Wiley, Department of Education, University of California at Los Angeles

Participant	Doctoral study, Year of degree	1964-65 Position	1965-66 Position
Andreas, Burton G.	State Univ. of Iowa, 1951	Assoc. prof. of psychology, Univ of Rochester	same
Asher, James J.	Univ. of Houston, 1957	Assoc. prof. of psychology, San Jose State College	same
Azuma, Hiroshi	Illinois, 1960	Assoc. prof., Faculty of Education, Univ. of Tokyo	same
Baron, Reuben M.	New York Univ., 1963	Asst.. prof. of psychology, Wayne State University	same
Bass, Alan R.	Illinois, 1963	Asst. prof. of psychology, Wayne State University	
Bentler, Peter M.	Stanford, 1964	NIMH postdoctoral fellow, ETS, Princeton	Asst. prof. of education, UCLA
Black, Harvey B.	Indiana, 1963	Asst. prof. in audio-visual research, Indiana	same
Bormuth, John R.	Indiana, 1962	Asst. prof. of education, UCLA	same

Participant	Doctoral study, Year of degree	1964-65 Position	1965-66 Position
Cazden, Mrs. Courtney	Harvard, 1965	Research assistant, Lab of Social Relations, Harvard	Asst. prof, Grad. School of Education Harvard
Dalrymple-Alford, E. C.	Birkbeck College (Univ. of London),	Asst. prof. of psychology American Univ. of Beirut, Lebanon	same
Davis, Stanley	Cornell, 1951	Dean of Students, Cornell	same
Della-Piana, Gabriel	Illinois, 1956	Assoc. prof of educational psychology, Utah	Director, Bureau Educational Research Univ. of Utah
Dick, Walter	Pennsylvania State, 1965	Research associate, Office of Examination Services, Penn. State Univ.	H.R.B. Singer, Inc. Science Park State College, Pa.
Fishman, Joshua A.	Columbia, 1953	Prof. of psychology and sociology, Yeshiva Univ. New York	same
Gans, Barbara	Michigan, - - -	Teaching fellow, Michigan	same
Grande, Peter P.	Notre Dame, 1964	Counseling-Teaching, Notre Dame	same
Guttentag, Marcia	Adelphi, 1960	Asst. prof of psychology, State Univ. of New York Stony Brook	Social Interaction Labs, Dept. of Sociology, Yale
Haga, Jun	Univ. of Tokyo	Lecturer in educational psychology, Kobe Univ., Kobe, Japan	same

Participant	Doctoral study, Year of degree	1964-65 Position	1965-66 Position
Heckhausen, Heinz	Munster Univ., 1954	Prof. of psychology, Ruhr Univ. at Bochum, B. R. Germany	same
Hennessy, Bernard C.	Wisconsin, 1955	Director, National Center for Education in Politics, New York	same
Hill, Arthur H.	Minnesota, 1960	Director of Research, Testing and Counseling Center, Univ. of Texas	same
Husek, Ted	Illinois, 1958	Asst. prof of education, UCLA	same
Klahr, David	Carnegie Inst. - - -	Graduate student, Carnegie Institute of Technology	same
Lawrence, Philip J.	Univ. of Canterbury, 1955	Reader in education, Univ. of Canterbury, Christchurch, N. Z.	same
Lewin, Isaac	Wayne State, 1965	Teaching assoc., Wayne State Univ.	Chairman of dept. of psychology at Bar-Ilan, Israel
Macnamara, John	Edinburgh, 1963	Lecturer in educational psychology, St. Patricks Training College, Eire	same
Munsinger, Harry	Oregon, 1962	Asst. prof. of psychology, Illinois	same
Madaus, George F.	Boston College, 1964	Asst. prof. of education, Worcester State College, Mass.	same

Participant	Doctoral study, Year of degree	1964-65 Position	1965-66 Position
Neale, Daniel C.	Minnesota, 1961	Assoc. prof. of educational psychology, Minnesota	same
Overing, Robert L. R.	McGill, 1957	Asst. prof., McGill Univ. (on leave), research assistant, Bureau of Educational Research, Univ. of Utah	same
Snow, Richard E.	Purdue, 1963	Asst. head, Instructional media research unit, Purdue	same
Torrey, Jane W.	U. C., Berkeley, 1951	Assoc. prof. of psychology, Connecticut College	same
Wallace, J. G.	Univ. of Glasgow	Research fellow in psychology in Institute of Education, Univ. of Bristol, England	same
Williams, E. Belvin	Columbia, 1962	Acting Director-Computer Center, Asst. prof. of psychology	Director-Computer Center, Asst. prof. of psychology
Wilson, James W.	Stanford, - - -	Research assistant, SMSG, Stanford	same
Wodtke, Kenneth H.	Univ. of Utah, 1963	Asst. prof. of psychology and education, Penn. State	same
Wright, Patricia	Univ. of London, - - -	Post graduate research student, University of London	same